

This data is the second release of retrieved X_{CO_2} from GOSAT data by the ACOS project for preliminary evaluation by the broader community beyond the immediate ACOS team. The data now includes ocean glint scenes that are still being evaluated and should be considered as a “preliminary” product.

Initial data validation analyses have been performed on a small subset of the ACOS version 2.8 data (processed for observations taken in July 2009). The data were compared to Total Carbon Column Observing Network (TCCON) ground-based column measurements at 8 different sites ranging in latitude from 53 N to 45 S. From this preliminary analysis, it has been determined that the ACOS X_{CO_2} retrievals are on the order of 6.5 ppm lower (1.8 to 2.8 ppm standard deviation) than what is measured by TCCON. The bias shows some variation with latitude but is between -5.1 and -8.1 ppm for each of the 8 stations. The data used in the comparisons are a zonal, monthly average using 10 degree latitude bins. The bias between ACOS and TCCON is smaller than it was for the version 2.7 data for the same time period. Preliminary analysis has also shown that the ACOS retrieved surface pressure is typically 10 hPa higher than the ECMWF product. This overestimate of surface pressure accounts for roughly half of the low bias in X_{CO_2} . Differences between the ACOS 2.7 and 2.8 products also show latitudinal and seasonal variations on the order of 0.5-2.0 ppm for X_{CO_2} and 1-2 hPa for surface pressure. These differences in the X_{CO_2} data from the two ACOS builds are largely due to changes in how the GOSAT radiances are calibrated for this release (temporal variations in the calibration).

In comparisons with TCCON data and analysis of a large selection of the ACOS dataset, it is seen that the ACOS data display a significantly higher level of variability than is expected for X_{CO_2} . The large variability continues to be investigated.

The ACOS data product is still being improved and validation analysis for v2.8 is ongoing. The priority of future releases of ACOS data will be to reduce the biases and other error terms in the X_{CO_2} product. A more detailed estimate of biases relative to the TCCON network will also be provided with future releases.